

To: State of Montana Legislature Environmental Quality Council May 7, 2010

From: Norman A. Bishop, retired resources interpreter, Yellowstone National Park

Subject: Agency Oversight: FWP - Wolf Management (Public Comment)

While the EQC is discussing numerous facets of wolf management, I suggest the Council might wish to include considering the question, "What good are wolves?"

As early as 1944, Adolph Murie realized that wolves selected weaker Dall sheep, "which may be of great importance to the sheep as a species." In 1951, his brother, Olaus Murie, thought predators may have an important influence during severe winters in reducing elk herds too large for their winter range. In 1967, Douglas Pimlott pointed out that wolves control their own densities. Those observations remain cogent today.

Restoration of wolves to Yellowstone has added exponentially to our knowledge of how natural ecosystems work. It has also reminded us that predation is one of the dominant forces in all of nature, present in ecosystems worldwide over millions of years.

Predation of wolves is important to the integrity of the Yellowstone ecosystem, but we should realize that, before their return to Yellowstone's northern range, 17 mountain lions there killed 611 elk per year, sixty grizzly bears killed 750 elk calves annually, and 400 coyotes killed between 1100 and 1400 elk per year (Crabtree and Sheldon).

Climate and human harvest account for most of the recent decline of the northern Yellowstone elk herd, coupled with the effects of five predators: grizzly bears, black bears, cougars, and coyotes. These are parts of a system unique in North America by its completeness (White and Garrott).

Berger et al (2001) demonstrated "a cascade of ecological events that were triggered by the local extinction of grizzly bears...and wolves from the southern (GYE)." In about 75 years, moose in GRTE erupted to 5 times the population outside, changed willow structure and density, and eliminated neotropical birds; Gray Catbirds and MacGillivray's Warblers.

Incidentally, wolves haven't eliminated moose from Yellowstone. But burning of tens of thousands of acres of moose habitat in 1988 (mature forests with their subalpine fir), hit the moose population hard, and it won't recover until the forests mature again (Tyers).

Wolves change species abundance, community composition, and physical structure of the vegetation, preventing overuse of woody plants like willow, reducing severity of browsing on willows that provide nesting for songbirds. In Banff, songbird diversity and abundance were double in areas of high wolf densities, compared to that of areas with fewer wolves (Hebblewhite and Smith). Fewer browsers lead to more willows, providing habitat for beaver, a keystone species, which in turn create aquatic habitat for other plants and animals.

By reducing coyotes, which were consuming 85% of the production of mice in Lamar Valley, restored wolves diverted more food to raptors, foxes, and weasels. By concentrating on killing vulnerable calf elk and very old female elk, wolves reduce competition for forage by post-breeding females, and enhance the nutrition of breeding-age females. Wolves promote biological diversity, affecting 20 vertebrate species, and feeding many scavengers (ravens, magpies, pine martens, wolverines, bald eagles, gray jays, golden eagles, three weasel species, mink, lynx, cougar, grizzly bear, chickadees, Clark's nutcracker, masked shrew and great grey owl). In Yellowstone, grizzly bears prevailed at 85% of encounters over carcasses, and they usurp nearly every kill made by wolves in Pelican Valley from March to October. Some 445 species of beetle scavengers benefit from the largess of wolf-killed prey. In Banff and Yellowstone, no other predator feeds as many other species as do wolves. Wolf-killed elk carcasses enhance local levels of soil nutrients; 20-500% greater nitrogen, phosphorous and potassium (Hebblewhite & Smith).

An average of four ravens were counted on carcasses in Lamar Valley pre-wolf. Post-wolf, that increased to 28 average, with as many as 135 seen on one carcass. Eagles seen on carcasses increased from an average of 1 per four carcasses to 4 per carcass (Stahler et al, 2002).

By lowering elk numbers, wolves may contribute to higher bison numbers; by decreasing coyotes, higher pronghorn numbers. Wolves may ameliorate ungulate-caused landscape simplification (White & Garrott).

Wolves may cause elk to shift habitat, using less aspen, and favoring songbirds that nest in the aspen (Fortin et al).

Hunting by humans does not benefit scavengers the way wolf kills do. Carrion from wolf kills is more dispersed spatially and temporally than that from hunter kills, resulting in three times the species diversity on wolf kills versus hunter kills. Wolves subsidize many scavengers by only partly consuming their prey; they increase the time over which carrion is available, and change the variability in scavenge from a late winter pulse (winterkill) to all winter. They decrease the variability in year-to-year and month to-month carrion availability (Wilmers et al).

Wolves buffer the effects of climate change (Wilmers & Getz 2005). In mild winters, fewer ungulates die of winterkill, causing loss of carrion for scavengers. Wolves mitigate late-winter reduction in carrion by killing ungulates all year.

Mid-sized predators can be destructive in the absence of large keystone predators. In the absence of wolves, pronghorn have been threatened with elimination by coyotes. Wolves have reduced coyotes, and promoted survival of pronghorn fawns. Pronghorn does actually choose the vicinity of wolf dens to give birth, because coyotes avoid those areas (Byers & Smith).

Chronic wasting disease could wipe out our elk and deer. It is plausible that wolves, which continually test elk and deer, looking for vulnerable animals, could remove sick animals and reduce the spread of the disease. Hunters can't do that.

Wolves also scavenge carrion, such as aborted bison or elk calves. By eating them, they may reduce the spread of Brucellosis to other bison or elk. Wolves also cause elk to congregate in smaller groups, potentially slowing the spread of diseases that thrive among dense populations of ungulates.

Restoration of wolves has cost about \$30 million, but has produced a \$35.5 million annual net benefit to greater Yellowstone area counties, based on increased visitation by wolf watchers (Duffield et al.). Some 325,000 park visitors saw wolves in 2005, and in Lamar Valley alone, 174,252 visitors observed wolves from 2000 to 2009, and wolves were seen daily in summers for nine of those ten years.

Wolves cause us to examine our values and attitudes. Paul Errington wrote, "Of all the native biological constituents of a northern wilderness scene, I should say that the wolves present the greatest test of human wisdom and good intentions."

Aldo Leopold, father of game management in America, said, "Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; ... The land is one organism." (From an unpublished 1938 essay, "Conservation," on p. 145-6 of Round River.)

Leopold also pointed out that the first rule of intelligent tinkering with natural ecosystems was to keep all the pieces. Eliminating predators is counter to that advice.

Wolves remind us to consider what is ethically and esthetically right in dealing with natural systems. As Leopold wrote in his essay, "The Land Ethic," "A land ethic ... does affirm (animals') right to continued existence...in a natural state." He concluded, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

(I was the resources interpreter at Yellowstone National Park who was principally responsible for educating the public about wolves and their recovery from 1985 to 1997, when I retired. I led field courses on wolf ecology and restoration from 1997 to 2005 for the Yellowstone Association Institute. I am a member of the board of the Wolf Recovery Foundation, and a volunteer for the International Wolf Center.)

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